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FYZ

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From: Howard Hatayama *H*²

Subject: Response to Commitments 23 & 25

On November 9, 2005, Under Secretary David Garman issued a memo on his expectations for completion of Commitment 23 Working Planning & Work Execution and Commitment 25 Feedback & Improvement. Don Erbschloe subsequently issued a memo to Office of Science site managers to perform an assessment of the effectiveness of the ISM in these two areas.

Attached please find our response to Commitments 23 and 25. We have identified a few items that we can fine tune to further strengthen the Lab's safety program. In addition, we have recently completed an external Peer Review and we anticipate that the report will identify other opportunities for improvement.

Thank you for the opportunity to comment on these important initiatives.

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DOE Commitment 23
Descriptions of LBNL Work Planning and Work Control
Programs and Processes

Performance Objective WPC-3: Work Control Program Documentation

The contractor has developed an effective work planning and control process.

Criteria

Criterion 1: *Contractor work control manual/procedure for initiating, analyzing, and developing work control documents, including job hazard analysis, is approved and implemented.*

The processes described are contained within LBNL's Institutional Integrated Environment, Health and Safety Management Plan (Pub 3140) and LBNL's Health and Safety Manual (Pub 3000).

Criterion 2: *The contractor's work control process establishes the level of review and approval for different types of work control documents. The type of document chosen is based upon the degree of risks, hazards, and complexity of the work activity.*

The graded approach for work authorizations is described within Chapter 6, "Safe Work Authorizations" within LBNL's Health and Safety Manual (Pub 3000).

Criterion 3: *The contractor has established work planning/control requirements for all personnel performing work at their site, including subcontractors. Affected personnel are trained on these requirements.*

The work planning/control requirements described in Chapter 6, "Safe Work Authorizations" within LBNL's Health and Safety Manual (Pub 3000) apply to all work performed at LBNL. Requirements specific to subcontractors are contained within subcontract provisions provided by LBNL's Procurement Department.

Criterion 4: *The contractor's work control manual/procedure includes turnover requirements when line management and/or first line supervisor responsibilities are transferred.*

Scientific work, including formally authorized and self-authorized work, is generally single shift and no transfer of responsibilities takes place. Facilities maintenance (Plant Maintenance Technicians) has a shift overlap for pass-on information.

Criterion 5: *The contractors work control manual/procedure includes a process for lessons learned/feedback during the execution of work control activities, including incorporation of lessons learned into active and in-development work control documents.*

The Lab has a formal lessons learned program as described in its UC/ LBNL Assurance Plan. The Lab also participates in the DOE-sponsored SELLS lessons learned program and disseminates the SELLS lessons learned to targeted audiences. However, the process of capturing, developing, and distributing lessons learned is not very robust.

Corrective Action: A process improvement team (PIT) representing several Laboratory organizations is formed and will begin meeting in February 2006. This PIT will determine the best methodology for capturing and disseminating lessons learned across the institution. A formal process, which will be a significant improvement on the existing model, should be in place by Summer 2006.

Criterion 6: *The contractor's work control manual/procedure includes a process for post activity review, including incorporation of lessons learned into active and in-development work control documents and/or work control manual/procedure.*

See Criterion 5 above. LBNL's Lessons Learned program is described at <http://www.lbl.gov/ehs/Lessons/index.shtml>.

Criterion 7: *The qualification for Work Control Managers and Planners are established.*

LBNL does not use the functions "Work Control Manager" and "Planner" within the context of this document (which is directed at nuclear facilities; LBNL is not a nuclear facility). All LBNL staff complete the Job Hazards Questionnaire (JHQ); the JHQ process analyzes the work and defines training requirements. Scientific staff who plan, control and manage their scientific work are selected through a process that includes definition of qualifications (by the hiring authority) and review of education, training and past performance. Staff who construct, maintain and operate LBNL's physical facilities are recruited using standard position descriptions outlining required skills, knowledge and abilities. These standard position descriptions are established and maintained by LBNL's Human Resources Department.

Criterion 8: *Records that document the successful completion and qualification of Work Control Managers and Planners are retained and auditable.*

As noted above, since LBNL does not use "Work Control Manager" and "Planner" within the context of this document, there is no formal qualification process. Human Resources records are maintained by the Human Resources Department. Records of training acquired through LBNL are maintained within LBNL's Training Program.

Performance Objective WPC-4: Work Planning and Control Activity

Proposed work activities are adequately defined and analyzed to identify hazards and their associated controls.

(The Lawrence Berkeley National Laboratory (LBNL) interprets this performance objective in terms of our own DOE authorized operations. For this objective, the term work control is interpreted to mean work authorization at LBNL. Pub 3000, Chapter 6, provides guidance as to the work authorization level required for work to be performed. Operations and infrastructure support work (plant operations and maintenance, design, construction and directorate operations and support) typically are conducted under line management authorization although some Facilities plant and institutional operations may involve formal work authorizations such as environmental permits (RCRA Part B Permit for Hazardous Waste Handling Facility, sanitary district discharge permits, etc). Research activities are typically authorized at the line management level or the formal work authorization level. Responses to each WPC criterion bear combined Operations and Infrastructure components and a research component).

Criteria

Criterion 1: Initial discussion/walk down of the proposed work activity is performed by appropriate personnel (e.g., line management, engineer, planner, etc.) to ensure that the work is properly scoped and that boundaries are understood.

Infrastructure: The customer, estimator, engineer, shop superintendent, craft worker and EH&S representative collaborate as necessary to define the scope of proposed work to satisfy LBNL ISM requirements and in accordance with the LBNL Facilities/EH&S Interface Policy. 7

Research: Both Line Management Authorization and Formal Work Authorizations for higher hazard work require requisite and sufficient initial and periodic observation and review by the appropriate level of supervision and management, as stated in Pub 3000, Chapter 6 and the LBNL ISM Plan.

Criterion 2: A team (team) comprised of the appropriate personnel (e.g., planner, work supervisor, workers, safety and health Subject Matter Experts, etc.) is selected by line management to participate in the development of the work control document.

Infrastructure: As per the response to Criterion 1. Additionally, Standard work control/work authorization for plant operations work is the Work Request Center Work Order. Note, however, work authorization is not always a written document.

Research: As per Criterion 1.

Criterion 3: The team performs effective walk downs and Job Hazard Analyses in order to develop work steps/techniques and identify possible hazards and their associated controls.

Infrastructure: Effective walk downs and Job Hazard Analyses that contribute to proper work process, techniques and control of hazards are inherent components of Criteria 1 and 2 above. Project managers, superintendents, shop supervisors, and craft all contribute to this process.

Research: As per Criteria 1 and 2 above.

Criterion 4: The team considers potential upset conditions, accidents, and "what if" scenarios and their consequences during the walk downs and JHAs.

Infrastructure: Design and review is performed by varying degree based on size of job and level of risk. The design review process starts at conceptual planning and continues through design stages to final design. The design review engineering and EH&S teams continue support throughout construction to assure that changes meet code and Lab requirements. This is mandated by Facilities design and construction procedure and the Facilities/EH&S Interface Policy.

Research: The risk and consequence analysis process in Pub 3000, Chapter 6, Appendix E is designed to address Criterion 4 issues.

Criterion 5: The team selects controls based upon the following hierarchy: (1) hazard elimination/reduction, (2) engineered controls, (3) administrative controls, and (4) personal protective equipment.

Infrastructure: The overall project design review and preliminary hazard analysis process, shop supervisor, superintendent, craft worker, and subcontractor pre-job hazard assessment/analysis, and task-specific activity hazard analyses all incorporate the fundamental hazard control hierarchy.

Research: The fundamental hierarchy of hazard control is the basis for Pub 3000, Chapter 6 work authorization.

Criterion 6: The team ensures that the level of control established for a hazard is maintained throughout the activity or until the hazard has been eliminated or reduced (controls can be graded to level of hazard reduction). [This Criteria addresses potential loss of safety function during D&D and may not be applicable to all work activities]

Infrastructure: Line management and EH&S inspections are programmatic requirements under Lab ISM and the Lab Self-assessment program.

Research: Line management and EH&S inspections are programmatic requirements under Lab ISM and the Lab Self-assessment program.

Criterion 7: The team evaluates the possibility of creating additional hazards due to selected controls (i.e., excessive PPE causing heat exhaustion) and also evaluates the possibility of negative synergistic effects of selected controls.

Infrastructure: The design review process incorporates EH&S subject matter expertise to ensure controls and hazard mitigation do not conflict with each other. EH&S oversight and support of project management is provided as necessary. Shop supervisors, superintendents, craft workers conduct pre-job hazard assessment and analysis and consider risk factors of the controls and protective measures.

Research: Formal work authorizations consider synergistic and aggregate effects of hazards during the hazard assessment, identification and control development.

Performance Objective WPC-5: Work Planning and Control Process

The contractor work planning process generates work control documents that lead to safe and efficient completion of work activities.

Criteria

Criterion 1: *The work scope and associated boundaries are clearly defined.*

The work scope and associated boundaries are defined at every level throughout the Lab consistent with the principles outlined in LBNL PUB-3140, *Integrated Environment, Health and Safety Management Plan: Integrated Safety Management (ISM) System*. As part of the work planning process, principal investigators, managers, and supervisors (work leaders) are required to consider what hazards, risks, and concerns are present, and to implement appropriate controls.

Criterion 2: *The work control document is written in a clear, concise, and worker friendly manner.*

Documents for work control are organized into three basic levels at the Berkeley Lab: line management, formal authorization, and facility-based authorization. Examples of the authorizations falling under these are listed in Chapter 6 of LBNL's Publication-3000 (PUB-3000), *Safe Work Authorizations*. These authorizations are not only tailored to the type of authorization, but to the specific hazard(s), and as such provide clear and concise information to all for safe operations.

Criterion 3: *The work steps for activities are properly sequenced.*

Chapter 6 of PUB-3000 provides templates (e.g., Appendices A, B, C, E) for all levels of authorizations to ensure that work steps for activities are considered and followed in an organized fashion.

Criterion 4: *Work control documents adequately incorporate technical and administrative requirements (e.g., contract, safety basis, regulatory, consensus codes, etc.).*

Chapter 6 of PUB-3000 provides templates for work control documents to ensure that all requirements, both technical and administrative are addressed. For project-based work activities, Appendix G of Chapter 6 provides an optional tool for divisions and work leaders to document that consideration has been given to possible formal authorizations that might be required for the work. In addition, line management and formal authorizations are renewed annually, and facility-based documents are renewed periodically based on regulatory and other considerations.

Criterion 5: *Work hazard controls identified in the JHA have been incorporated into the work control document.*

Appendices A, B, C, and E of Chapter 6 of PUB-3000 provide "trigger levels" for ES&H concerns that need to be incorporated in work control documents (safe work authorizations). In addition, Appendix G of Chapter 6, "Hazards, Equipment, Authorizations & Review (HEAR) Database Client Input Form - modified for Formal Authorizations and Project Hazard Analysis" is a tool for use in identifying hazard and controls for consideration in safe work authorizations.

HEAR
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Criterion 6: The controls for activity specific hazards are delineated immediately before the work control document step where the hazard is encountered and are highlighted to emphasize their importance.

Templates are provided for safe work authorizations (e.g., Appendices A, B, C, and E of Chapter 6 of PUB-3000). These templates provide an organized structure for safety documentation that ensure a sequential addressing of hazards / controls consistent with the encountering of work activities.

Performance Objective WPC-6: Work Planning and Control Oversight

Contractor personnel perform work in accordance with approved work control documents.

Criteria

Criterion 1: First line supervisors and workers are knowledgeable of their work control documents and meet all applicable training and medical requirements.

The LBNL Integrated Environment, Health and Safety Management Plan, (PUB-3140-Rev.3) Section D explains how first line supervisors and workers are knowledgeable of and responsible for their work control documents. The mechanisms employed are explained in the LBNL Health and Safety Manual, (PUB-3000 May 2005) Chapter 6.

Identification of specific training requirements is embedded in this system. As a part of the work authorization procedures in Chapter 6 of PUB-3000, supervisors are responsible to assure that all of their employees complete a job hazard questionnaire (JHQ) as described in PUB-3000 Chapter 24.5.2 that identifies all training requirements.

A graded approach is used to guide the formality and detail used in these work control documents. For lower hazard operations, completion of the JHQ and associated training is considered adequate. For higher hazard or more complex operations, formal work control documents are promulgated with signatures verifying individuals and supervisors understanding of the requirements. These are referenced in PUB-3000 Chapter 6 Appendix B.

Criterion 2: Operations work control authority reviews and authorizes all work control documents prior to commencement of work. He/she is required to evaluate all work at a facility and/or site to ensure work activities of one scope do not adversely affect the safe work of another.

Safety of all operations at Lawrence Berkeley National Laboratory is managed according to the principles outlined in LBNL/PUB-3140, Integrated Environment, Health and Safety Management Plan: Integrated Safety Management (ISM) System. A key principle is that of work authorization.

Authorization is a review and management approval process designed to ensure that procedures, controls, and resources are in place before the work begins. All work at LBNL proceeds under authorization. Work authorization classifications include the following:

Line Management: An authorization implied from other documentation, or explicit but administered by the responsible division doing the work. Examples include routine laboratory or shop work, and work on equipment containing stored energy.

Formal: A written document, concurrently authorized by the responsible division and by the EH&S Division, that describes the scope of work, required procedures and controls, authorized materials and equipment to be used, and staff authorized to conduct the work. Examples include Radiological Work Authorizations, Activity Hazard Documents, research involving human or animal subjects, and some high pressure work.

Facility-Based: Hazard analysis and controls are based on the facility as a whole rather than on an individual operation. Examples include Safety Analysis Documents, air and water discharge permits, some other regulatory permits and NEPA/CEQA analyses.

Proposed work activities are adequately defined and analyzed to identify hazards and their associated controls. The LBNL Health and Safety Manual, PUB-3000 Chapter 6 describes work authorizations and the work authorization process.

PUB-3140 Section A, paragraph 7 states the policy that “the conditions and requirements that must be satisfied for operations to be initiated and conducted are clearly established and agreed upon.” This is also implemented on a graded approach. For higher hazard work, as defined in Appendix B of Chapter 6, PUB-3000, formal review and authorization processes are identified before work may begin. These include evaluation of all work functions that may impact others. For lower hazard work, the JHQs are required to be completed within 30 days of employment.

Criterion 3: Effective pre-evolutionary briefings are performed.

Pre-evolutionary briefings, as appropriate, are typically documented as part of the work authorization. Examples include pre-job briefings for radiological work permits (PUB-3000 Chapter 21.6.2) and permitted electrical work (PUB-3000 Chapter 8.6.4).

Criterion 4: First line supervisors and workers follow work control document instructions as written, or if unexpected conditions arise, workers and supervisors take action to stop the work and follow their change control process.

Work control document instructions are promulgated on a graded approach. These are either included or referenced in the work authorizations as appropriate. See Appendix E, section 6 in Chapter 6, PUB-3000 for Activity Hazard Documents and Chapter 21.6.1 for the description of protocols for radiological work authorizations for examples.

Criterion 5: First line supervisors and workers understand their stop work authority.

Stop Work authority is delineated in the General Policy and Responsibilities section of the LBNL Health and Safety Manual (Chapter 1.5). This is communicated to staff in New Employee Orientation class and reinforced through divisions' implementation of ISM and ES&H self-assessment.

Corrective Action: The EH&S Division continues to improve communication and understanding of the Stop Work policy. In recent months, this policy has been posted on the EH&S Division website. The policy has been directly communicated to the Safety Review Committee and Division Safety Coordinators Committee, who were tasked with disseminating this policy among division staffs. The Stop Work policy also appeared in Today At Berkeley Lab (TABL) on September 14, 2005, and will appear annually in this publication. In addition, an electrical safety specific Stop Work reminder appeared in TABL on August 15, 2005.

Criterion 6: *Work control documents contain adequate documentation (i.e., work status log) regarding work status including the nature of and response to unexpected conditions.*

The nature and detail of documentation regarding work status varies with hazard level and type. Each hazard-specific chapter in PUB-3000 describes appropriate documentation requirements for work status. Examples are LOTO for electrical work in Chapter 8 and posting/signage requirements for radiological work as described in Chapter 21.

Criterion 7: *Lessons learned/feedback is incorporated into active and in-development work control documents in a timely manner.*

Lessons learned and feedback is incorporated into ISM at LBNL at the institutional, divisional/departmental and at the project/activity level. These are described in detail in the institutional ISM Plan, PUB-3140, sections B, C and D.

Performance Objective WPC-7: Work Planning and Control Oversight

The Contractor has an established process that requires line management and assessment personnel perform timely assessments/ surveillances of the work planning and control process, including periodic reviews of active and in-development work control documents.

Criteria

Criterion 1: *The contractor has scheduled and performed independent and self-assessment of the work planning and control process. These activities are of sufficient scope, detail, and quantity that the contractor can ascertain the status of the work planning and control process.*

The LBNL ES&H Self-Assessment program requires independent and self-assessment of the work planning and control process. This program is described in Environment, Safety, and Health Self-Assessment Program (PUB-5344, rev.3). Division self-assessments are performed annually by line management of each division. Integrated

Functional Appraisals and Management of ES&H reviews are performed triennially for each division and serve as independent assessments of the work planning and control process.

Criterion 2: *Line managers periodically perform surveillances, which include the observations of job walk downs and JHA walk downs/ meetings, pre-evolution briefings, and work performed to work control documents.*

Division self-assessment requires all line managers to inspect their staff workspaces and communicate ES&H issues with their staff. The Division Self-Assessment is described in PUB-5344, rev.3. Division self-assessments criteria, which measure performance of these activities, are negotiated annually by division management of every division.

Criterion 3: *Line managers periodically review in-development and approved work control documents.*

PUB-3000 Chapter 6 requires formal review of all in-development formal authorizations by division line management, division management, and the EH&S Division. In addition, annual review is required for all approved formal authorizations.

Criterion 4: *The contractor tracks and trends the results of oversight activities performed on their work planning and control process and takes appropriate actions.*

The annual ES&H Self-Assessment Report (LBID-2489) identifies noteworthy practices and opportunities for improvement for every Laboratory division. Results from each of the three forms of ES&H self-assessment are analyzed in all divisions to identify institutional opportunities for improvement. Divisions and LBNL are required to address these opportunities for improvement during the following self-assessment year.

DOE Commitment 25

Descriptions of LBNL Integrated Safety Management System Feedback and Improvement

Performance Objective F&1-1: Contractor Program Documentation

Contractor Line management has established a comprehensive and integrated operational assurance system which encompass all aspects of the processes and activities designed to identify deficiencies and opportunities for improvement, report deficiencies to the responsible managers, complete corrective actions, and share lessons learned effectively across all aspects of operation.

Criteria

Criterion 1: A program description document that fully details the programs and processes that comprise the contractor assurance system has been developed, approved by contractor management, and forwarded to DOE for review and approval. The program description is reviewed and updated annually and forwarded to DOE for review and approval.

The UC/ LBNL Assurance Plan describes the Lab's assurance system, process and activities. The current version of the LBNL Assurance Plan was reviewed and approved by University of California and Laboratory management in 2005. The Plan was forwarded to the DOE Site Office for review and concurrence in 2006.

Criterion 2: The contractor's assurance system includes assessment activities (self-assessments, management assessments, and internal independent assessments as defined by laws, regulations, and DOE directives such as quality assurance program requirements) and other structured operational awareness activities; incident/event reporting processes, including occupational injury and illness and operational accident investigations; worker feedback mechanisms; issues management; lessons-learned programs; and performance indicators/measures.

The LBNL assurance system includes assessment activities, occurrence reporting and investigation, lessons learned, performance indicators, and corrective action management. Formal worker feedback mechanisms are addressed in the EH&S authorization programs (described in PUB-3000 Chapter 6), LBNL safety committee program (described in the LBNL ISM Plan), and in the Internal Audit whistleblower program.

Criterion 3: The contractor's assurance system monitors and evaluates all work performed under their contract, including the work of subcontractors.

LBNL utilizes an authorization program to monitor and evaluate all work, including the work of subcontractors. Depending on the scope of work and level of hazards, authorization can be formal authorizations requiring independent review and approval. Work of limited scope

and hazard can be accomplished through a self-authorization process that requires line management review and approval.

Criterion 4: *The contractor's assurance system data is formally documented and available to DOE line management. Results of assurance processes are periodically analyzed, complied and reported to DOE line management as part of formal contract performance evaluation.*

LBNL assurance results and data are provided to Lab management and the DOE Site Office in the Lab's annual ES&H Self-Assessment Report (LBID-2489). In addition, results and data related to the formal contract performance evaluation are presented quarterly in LBNL/BSO Operational Awareness meetings and tri-party (DOE, UC, LBNL) contract performance meetings.

Criterion 5: *Contractors have established and implemented sufficient processes (e.g., self assessments, corporate audits, third-party certification or external reviews, performance indicators) for measuring the effectiveness of the contractor assurance program.*

The contractor assurance program was created in 2005, and therefore, the program has not yet implemented a formal process for measuring the effectiveness of the Lab's assurance system. It should be noted that the Lab achieved a DOE certification in 2003 for its ES&H self-assessment program.

Criterion 6: *Requirements and formal processes have been established and implemented that ensure personnel responsible for managing and performing assurance activities possess appropriate experience, knowledge, skills and abilities commensurate with their responsibilities.*

As described in the position descriptions of staff in the LBNL Office of Contract Assurance, all staff possess appropriate experience, knowledge, skills, and abilities to perform their assurance activities.

Performance Objective F&1-2: Contractor Program Implementation

2.1 Assessments & Performance Indicators: Contractor Line management has established a rigorous and credible assessment program that evaluates the adequacy of programs, processes, and performance on a recurring basis. Formal mechanisms and processes have been established for collecting both qualitative and quantitative information on performance and this information is effectively used as the basis for informed management decisions to improve performance.

Criteria

Criterion 1: *Line management has established and implemented a rigorous assessment program for performing comprehensive evaluations of all functional areas, programs, facilities, and organizational elements, including subcontractors, with a frequency, scope and rigor based on appropriate analysis of risks. The scope and frequency of assessments are*

defined in site plans and program documents, include assessments of processes and performance-based observation of activities and evaluation of cross-cutting issues and programs, and meet or exceed requirements of applicable DOE directives.

LBNL has a DOE-certified ES&H self-assessment program that regularly assesses performance in all functional areas of the Lab. The self-assessment program uses performance indicators, site inspections, corrective actions, and lessons learned to meet or exceed requirements of applicable DOE directives. The self-assessment program is described in the Self-Assessment Program document (PUB-5344).

Criterion 2: Rigorous self-assessments are identified, planned, and performed at all levels periodically to determine the effectiveness of policies, requirements and standards and the implementation status.

Updated performance indicators for self-assessments are identified annually. Each LBNL division plans and performs its self-assessments throughout the year, with data and results compiled for the Lab's annual self-assessment report. The annual report addresses effectiveness of policies, requirements, standards, and implementation status.

Criterion 3: Appropriate independent internal assessments are identified, planned and performed by contractor organizations or personnel having the authority and independence from line management, to support unbiased evaluations.

The Lab's Contractor Assurance Office, EH&S Division, and Internal Audit Office perform the appropriate independent internal assessments and assure the unbiased evaluations of Lab systems, programs, and activities.

Criterion 4: Line managers have established programs and processes to routinely identify, gather, verify, analyze, trend, disseminate, and make use of performance measures that provide contractor and DOE management with indicators of overall performance, the effectiveness of assurance system elements, and identification of specific positive or negative trends. Approved performance measures provide information that indicates how work is being performed and are clearly linked to performance objectives and expectation established by management.

The Lab's self-assessment program provides line managers with performance measures/indicators to routinely evaluate overall performance. The performance measures and indicators are linked to specific objectives and expectations under the Lab's Integrated Safety Management (ISM). The performance measures, objectives and expectations are updated annually based feedback and improvement from the previous year

Criterion 5: Line managers effectively utilize performance measures to demonstrate performance improvement or deterioration relative to identified goals, in allocating resources and establishing performance goals, in development of timely compensatory measures and corrective actions for adverse trends, and in sharing good practices and lessons learned.

As part of self-assessment requirements, line managers are evaluated for meeting objectives and expectations, allocating appropriate resources, correcting deficiencies in a timely

manner, and instituting two-way communication to address issues, trends, good practices, and lessons learned

Performance Objective F&1-2: Contractor Program Implementation

2.2 Operating Experience: The Contractor has developed and implemented an Operating Experience program that communicates Effective Practices and Lessons Learned during work activities, process reviews, and incident/event analyses to potential users and applied to future work activities.

Criteria

Criterion 1: Formal processes are in place to identify applicable lessons learned from external and internal sources and any necessary corrective and preventive actions, disseminate lessons learned to targeted audiences, and ensure that lessons learned are understood and applied.

The Lab has a formal lessons learned program as described in its Assurance Plan. The Lab also participates in the DOE-sponsored SELLS lessons learned program and disseminates the SELLS lessons learned to targeted audiences. A process improvement team for lessons learned has formed and will soon commence activities.

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Criterion 2: Line managers effectively identify, apply, and exchange lessons learned with the rest of the DOE complex. Lessons learned identified by other DOE organizations and external sources are reviewed and applied by line management to prevent similar incidents/events.

See Criterion #1 above.

Criterion 3: Formal programs and processes have been established and implemented to solicit feedback or suggestions from workers and work activities on the effectiveness of work definition, hazard analyses and controls, and implementation for all types of work activities, and to apply lessons learned.

As part of the self-assessment requirements, each division is evaluated for its two-way communication to assure sufficient feedback from workers on their work activities. In addition, the Lab promotes its whistleblower program for workers who wish to report concerns through an independent organization and investigation.

Performance Objective F&1-2: Contractor Program Implementation

2.3 Event Reporting: Contractor line management has established and implemented programs and processes to identify, investigate, report and respond to operational events and incidents and occupational injuries and illnesses.

Criteria

Criterion 1: Formal programs and processes have been established to identify issues and report, analyze, and address operational events, accidents, and injuries. Events, accidents, and injuries are promptly and thoroughly reported and investigated, including the identification and resolution of root causes and management and programmatic weaknesses, and distribution of lessons learned.

Berkeley Lab has instituted a series of internal and external systems for identifying, reporting and investigating operational events, accidents and injuries: SAARs, ORPS, CAIRS and DOE-BSO notification. The Lab utilizes the DOE required ORPS reporting system to identify issues and report, analyze, and address operational events, accidents, and injuries. For all accidents and injuries, regardless of ORPS reportability, the Lab requires line managers to complete the Supervisor Accident Analysis Report (SAAR), which also addresses root causes, management and/or program weaknesses, and lessons learned.

Occurrence Reporting (Pub 3000, Chapter 15)

- Occurrence Reporting and Processing System (ORPS) at Lawrence Berkeley National Laboratory (LBNL) notifies and keeps Laboratory management and applicable elements of the Department of Energy (DOE) informed of abnormal events that could adversely affect:
 - the health and safety of employees, guests, visitors and the general public
 - the environment.
 - the intended purpose of LBNL facilities.
 - the credibility of the DOE and/or LBNL

All LBNL divisions and departments, including subcontractors performing work at Berkeley Lab, are responsible for following ORPS procedures. Reportable occurrences require that the description, significance, causal factors, and corrective actions of the occurrence are fully documented and transmitted to the DOE ORPS Database. The LBNL ORPS procedures meet the requirements of DOE Order 231.1A, *Environment, Safety and Health Reporting*, and DOE Manual 231.1-2, *Occurrence Reporting and Processing of Operations Information*.

Lessons Learned (Pub 3000, Chapter 14)

- The Occurrence Reporting Processing System (ORPS) implements DOE Order 232.1, *Occurrence Reporting*, which dictates that divisions analyze occurrence criteria, as developed by the Order and the LBNL document *Occurrence Reporting*, LBID-1694, to determine root causes, corrective actions, and *lessons learned*.
- The Laboratory's Operating and Assurance Program (OAP) requires that management and personnel evaluate their performance to identify, correct, and prevent problems, and to ensure achievement of performance objectives. The LBNL Self-Assessment Program implements these requirements through a formalized information-gathering process of appraisals and assessments. The self-assessment process generates *lessons learned* within each division and the Laboratory as a whole.

These lessons are reported, by division, in annual self-assessment reports to the Office of Contract Assurance.

- The Laboratory's Accident Investigation Program has been developed to identify and eliminate accident causes to prevent recurrence. Accident investigation program is a major component of LBNL's safety, health, and environment programs and its emphasis is on accident prevention by engineering safe facilities and equipment, developing sound operational procedures, and providing adequate training and protective equipment. *Lessons learned* from the accident investigation process help to define and improve these efforts. The Accident Investigation Program is written to conform with the requirements of DOE Order 225.1, Chapters 1 and 2, and LBNL's *Health and Safety Manual*, LBNL/PUB-3000.

Accident Investigations (PUB 3000, Chapter 5)

- Occupational Injuries and Illness Cases

Injured employees are directed to Health Services for evaluation and treatment. The An online document, Supervisor's Accident Analysis Report (SAAR), is generated and sent to the supervisor to investigate and complete within two working days. Health Services will also initiate any required reports for Workers' Compensation purposes.

- Motor Vehicle Accidents and Property Damage Incidents

Depending on the venue, Berkeley Lab Security or local police authority and LBNL motor pool handle motor vehicle accident investigation and reporting, respectively. DOE is notified on form DOE 5484.3 when motor vehicle accident damage exceeds \$1,000. Accidents that result in property damage of \$5,000 or more are reported to DOE on form DOE 5484.3.

- For major incidents, an accident investigation teams will be appointed for all incidents that are deemed of sufficient severity or potential significance to require a detailed impartial analysis. The decision for individual cases rests with the responsible division director, the EH&S Division Director, and institutional safety committees (e.g. the Radiation Safety Committee).

Criterion 2: Contractor line management has established and implemented programs and process to identify, investigate, report, and respond to operational events and incidents and occupational injuries and illnesses.

LBNL reporting of operational events, accidents, and injuries follows ORPS and SAAR requirements and meets all applicable DOE directives and contract terms and conditions. As required by ORPS, the Lab conducts quarterly trending analysis of its occurrences, accidents, and injuries for the previous 12 months.

Performance Objective F&1-2: Contractor Program Implementation

2.4 Issues Management: The Contractor has developed and implemented a formal process to evaluate the quality and usefulness of feedback, and track to resolution performance and safety issues and associated corrective actions.

Criteria

Criterion 1: Program and performance deficiencies, regardless of their source, are captured in a system or systems that provides for effective analysis, resolution, and tracking. Issues management system elements include structured processes for determination of risk, significance, and priority of deficiencies; evaluation of scope and extent of condition; determination of reportability under applicable requirements; identification of root causes; identification and documentation of corrective actions and recurrence controls to prevent recurrence; identification of individuals/organizations responsible for corrective action implementation; establishment of milestones based on significance and risk for completion of corrective actions; tracking progress; verification of corrective action completion; and validation of corrective action implementation and effectiveness.

The LBNL Corrective Action Tracking System (CATS) provides for effective analysis, resolution, and tracking of program and performance deficiencies. This system is described in PUB-5344 (described as LCATS, renamed CATS) and the UC/ LBNL Assurance Plan.

Corrective Action: Although LCATS was regularly used by all Laboratory divisions, a new version of this database (CATS) has been developed. CATS is more user friendly than LCATS, and this improvement is expected to increase recording and tracking of safety deficiencies across the Laboratory.

Criterion 2: Issues management processes include mechanisms to promptly identify the potential impact of a deficiency and take timely actions to address conditions of immediate concern, including stopping work, system shutdown, emergency response, reporting to management, and compensatory measures pending formal documentation and resolution of the issue.

EH&S written policies and procedures provide mechanisms for the prompt identification of impact and actions required, including stop work, system shutdown, emergency response, reporting to management, and compensatory measures.

Criterion 3: Processes for analyzing deficiencies, individually and collectively, have been established that enable the identification of programmatic or systemic issues. Line management effectively monitors progress and optimizes the allocation of assessment resources in addressing known systemic issues.

The Lab uses processes in ORPS, CATS, SAAR accident investigations, and self-assessments to individually and collectively analyze deficiencies to identify programmatic and systemic issues. Such issues are summarized in the LBNL annual self-assessment reports. CATS supports line management in monitoring the resolution of issues.

Criterion 4: Processes for communicating issues up the management chain to senior management have been established and based on a graded approach that considers hazards and risks. Line management receives periodic information on the status of identified deficiencies and corrective actions and holds organizations and individuals accountable for timely and effective completion of actions. Line management has executed graded mechanisms such as independent verification and performance-based evaluation to ensure that corrective action and recurrence controls are timely, complete, and effective. Closure of corrective actions and deficiencies are based on objective, technically sound, and verified evidence. The effectiveness of corrective actions is determined on a graded basis and additional actions are completed as necessary.

Issue communication to senior management is accomplished quarterly in reports and presentations to the UC Contract Assurance Council. This body is described in the UC/LBNL Assurance Plan. The annual ES&H self-assessment report also summarizes the past year's issues and resolutions. Line management uses CATS to monitor progress of corrective actions, including responsibility, actions required, schedules, and closeout of corrective actions that prevent recurrence.

Criterion 5: Results of various feedback systems are integrated and collectively analyzed to identify repeat occurrences, generic issues, trends, and vulnerabilities at a lower level before significant problems result.

The LBNL Contractor Assurance Office uses feedback from its lessons learned program, ORPS quarterly analysis, and self-assessment program to integrate and collectively analyze occurrences, issues, trends and vulnerabilities to prevent more significant events from occurring.

Criterion 6: Individuals or teams responsible for corrective action development are trained in analysis techniques to evaluate significant problems using a structured methodology to identify root and contributing causes and corrective actions to prevent recurrence.

Personnel from the LBNL Contractor Assurance Office are trained in analysis techniques to evaluate issues, including causal analysis and corrective action development. At a lower scope level, division safety coordinators are trained to conduct self-assessments and to use CATS.

Corrective Action: In an effort to expand root cause analysis expertise across the Laboratory, LBNL has initiated a program for 90% of all division safety coordinators and EH&S Division liaisons to receive formal root cause analysis training by September 30, 2006.